

**IN THE CLAIMS:**

1. (Original) A method for controlling a feel back torque of a motor, the method comprising:
  - receiving a signal indicative of a difference between a desired motor position and an actual motor position;
  - filtering the received signal into a plurality of frequency bands; and
  - applying a gain to at least one of the filtered frequency bands in correspondence with at least one of the received signal and a low-pass portion of the received signal to provide a motor command.
2. (Original) A method as defined in Claim 1 wherein the motor is disposed relative to a differential.
3. (Original) A method as defined in Claim 2 wherein the motor and differential are comprised by an active steering system.
4. (Original) A method as defined in Claim 1 wherein said gain is variable.
5. (Original) A method as defined in Claim 1 wherein said gain is scheduled.
6. (Previously Presented) A controller for an active steering system, the controller comprising:
  - a feel control algorithm for controlling a feel back torque to a driver, said feel control algorithm comprising a filter, and at least one of a high-pass gain and a low-pass gain;
  - wherein said at least one of said high-pass gain and said low-pass gain operate on a high pass portion of an error signal and a low-pass portion of the error signal.
7. (Previously Presented) A controller as defined in Claim 6 wherein the at least one of the high-pass gain and a low-pass gain comprise a scheduling table indexed on the at least one of the error signal and the low-pass portion of the error signal.

8. (Original) A controller as defined in Claim 7 wherein said scheduling table is further indexed on at least one of a vehicle state estimate, an environment estimate, and a driver preference.

9. (Previously Presented) A controller as defined in Claim 6 wherein at least one of the high-pass gain and the low-pass gain is a non-linear function of the at least one of the error signal and the low-pass portion of the error signal.

10. (Previously Presented) A controller as defined in Claim 6 further comprising at least one absolute value function in signal communication with the at least one of the high-pass gain and the low-pass gain.

11. (Previously Presented) A controller as defined in Claim 6 further comprising a final output saturation check function in signal communication with the at least one of the high-pass gain and the low-pass gain.

12. (Previously Presented) A controller as defined in Claim 6 wherein said filter is a first-order filter.

13. (Original) A controller for an active steering system, the controller comprising:

means for receiving a signal indicative of a difference between a desired motor position and an actual motor position;

means for filtering the received signal into a plurality of frequency bands; and

means for applying a gain to at least one of the filtered frequency bands in correspondence with at least one of the received signal and a low-pass portion of the received signal to provide a motor command.

14. (Previously Presented) A method for actively controlling the steering of a motor vehicle, the method comprising:

receiving an operator input from an operator of the motor vehicle;  
receiving a stability input indicative of a dynamic stability of the motor vehicle;  
calculating a correction signal in accordance with the operator input and the stability input;  
filtering the correction signal into a plurality of frequency bands;  
applying a gain to at least one of the filtered bands to produce an output signal corresponding to a desired feel back torque; and  
adjusting an input to a differential actuator in accordance with the output signal.

15. (Original) A method as defined in Claim 14 wherein said adjusting comprises:

providing the output signal to an electric motor disposed relative to the differential actuator in order to adjust a steering angle of a steering actuator while maintaining desirable feel back torque characteristics.

16. (Currently amended) An active steering system comprising:

an input device;  
a differential actuator in operable communication with said input device;  
a steering actuator in operable communication with said differential actuator;  
and  
a feel controller in signal communication with said input device, said steering actuator, and said differential actuator for controlling a feel back torque to an operator, said feel controller includes a low-pass filter for dividing a signal into a low-frequency component and a high-frequency component.

17. (Original) An active steering system as defined in Claim 16, the differential actuator comprising:

a motor in signal communication with said feel controller; and

a differential unit disposed relative to said motor, said input device, and said steering actuator.

18. (Original) An active steering system as defined in Claim 17 wherein said differential unit is configured to provide a steering angle to said steering actuator that is substantially independent of an input from an operator.

19. (Original) An active steering system as defined in Claim 17 wherein said differential unit further comprises:

- an input gear axially affixed to a differential input shaft;
- an output gear axially affixed to a differential output shaft;
- a first spur gear meshingly engaged with said input gear and said output gear;
- a second spur gear meshingly engaged with said input gear and said output gear; and
- a worm drive meshingly engaged with a worm gear; said worm gear rotatably receiving said differential input shaft therethrough.

20. (Original) An active steering system as defined in Claim 19 wherein said worm drive is disposed at an end of a motor shaft, said motor shaft being coupled to said motor.

21. (Original) An active steering system as defined in Claim 16 wherein said feel controller comprises a high-pass gain function and a low-pass gain function.

22. (Cancelled).

23. (Currently amended) An active steering system as defined in Claim ~~22~~16 wherein said feel controller further comprises a summing function for receiving an input of the low-pass filter and an output of the low-pass filter, and for providing an input to a high-pass gain function.

24. (Cancelled).

25. (Cancelled).

26. (Previously Presented) An active steering system comprising:  
means for receiving a steering input from an operator of the motor vehicle;  
means for receiving a stability input indicative of a dynamic stability of the motor vehicle;  
means for calculating a correction signal in accordance with the steering input and the stability input;  
means for filtering the correction signal into a plurality of frequency bands;  
means for applying a gain to at least one of the filtered bands to produce an output signal corresponding to a desired feel back torque; and  
means for adjusting an input to a differential actuator in accordance with the output signal.

27. (Previously Presented) A motor controller, comprising:  
a feel control algorithm for controlling a feel back torque to an operator, said feel control algorithm comprising a filter, and at least one of a high-pass gain and a low-pass gain;  
wherein said at least one of said high-pass gain and said low-pass gain operate on a high pass portion of an error signal and a low-pass portion of the error signal.

28. (Previously Presented) A controller as defined in Claim 6 wherein said error signal is indicative of a difference between a desired motor position and an actual motor position.